

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000054685	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/EP2004/006912	International filing date (day/month/year) 25.06.2004	Priority date (day/month/year) 11.07.2003
International Patent Classification (IPC) or national classification and IPC C07C209/78, C07C209/86, C07C211/50		
Applicant BASF AKTIENGESELLSCHAFT		

1.	This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.	
2.	This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.	
3.	This report is also accompanied by ANNEXES, comprising: a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>2</u> sheets, as follows: <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).	
4.	This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application	

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:

- ☐ international search (Rule 12.3 and 23.1(b))
☐ publication of the international application (Rule 12.4)
☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-10 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

nos. _____ as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* 1-13 received by this Authority on 05.02.2005 with letter of 04.02.2005

nos.* _____ received by this Authority on _____

☐ the drawings:

sheets _____ as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (specify): _____

☐ any table(s) related to sequence listing (specify): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (specify): _____

☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-13	YES
	Claims		NO
Inventive step (IS)	Claims	1-13	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
1. This report makes reference to the following documents:			
D1: DE-A-19613554			
D2: EUGEN MÜLLER: "METHODEN DER ORGANISCHEN CHEMIE, Volume I/1" 1958, GEORG THIEME VERLAG, pages 557-558			
D3: WO-A-99/40059 corresponds to US-A-6433219, cited in the application			
D4: EP-A-0109931			
D5: EP 0 329075			
D6: WO-A-94/23099			
D7: EP-A-462697			
D8: WO-A-01/58847 cited in the application			
2. Novelty			
The present application meets the requirements of PCT Article 33(1) because the subject matter of claim 1 is considered novel (PCT Article 33(2)) over D1-D8.			
Document D1 also discloses a method for producing			

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

diaminodiarylmethanes by:

- step (a): reacting aniline with formaldehyde in the presence of hydrochloric acid as catalyst (see page 5, lines 34-51; claim 1);
- step (b): removing the catalyst by means of adsorption on a solid adsorption agent (see page 6, lines 8 and 13; page 7, lines 2-13), and
- step (c): processing and cleaning the reaction product (see page 7, lines 14 and 15).

According to claim 1, the adsorption agent is regenerated using the amine, which is used as feed stock for the method. This method feature cannot be found in D1 or in D2-D8 and therefore the subject matter of the application as per claims 1-13 is considered novel.

Documents D2 and D5-D7 generally disclose the use of a basic ion exchanger in order to remove excess acid from reaction mixtures. D3 describes a method for producing diaminodiarylmethanes which also involves reacting aniline with formaldehyde in the presence of hydrochloric acid as catalyst, the acid not being removed by using a basic ion exchanger, but by separating the salt following neutralisation with caustic soda. D4 describes a method for producing diaminodiarylmethanes, but does not disclose the use of a basic ion exchanger for removing excess acid from reaction mixtures.

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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D8 describes a method for producing MDA, in which a dried condensate of aniline and formaldehyde, in the form in which it is administered, is reacted in the presence of solid, inorganic, acid catalysts.

3. Inventive step

According to the description (see, in particular, page 2, paragraph 2 and page 3, lines 5-10), the problem of interest is that of developing a method for producing diaminodiarlymethanes using an increased amount of acid, which is already known from D3 (see example 3) and D4 (see page 3, lines 5-22), but without the disadvantages associated therewith, for example an increased amount of salt in the waste water.

D1 and D8 are equally relevant to the assessment of inventive step and are both considered the closest prior art. Proceeding from the teaching of D1 and D8, and of D2-D7, a person skilled in the art could not learn that it is possible to remove all the acid used as catalyst for the condensation from the reaction mixture using an adsorption agent and that the adsorption agent can be regenerated using the amine that was used as starting product for the condensation. The acid and amine mixtures can again be fed back to the starting mixture. It is therefore possible to carry the acid used essentially through the cycle.

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The subject matter of the application is therefore
considered inventive.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The wording "higher oligomers" in claim 2 is vague and undefined and renders the subject matter of the claim unclear. Moreover, an unclear expression cannot be used by the applicant to delimit the invention in relation to the prior art.